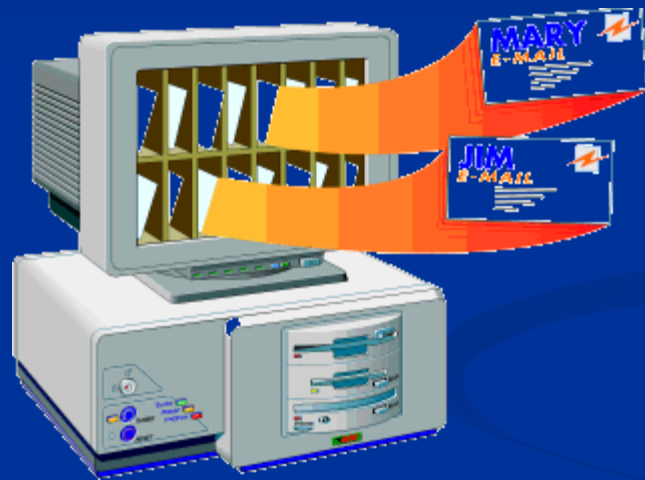


# Email Systems



Abdimuratov Ajiniyaz

# Overview

- Email Basics
- What Makes Up An Email
- How Email Works
- What Are TCP/IP Ports

# Email Basics

- What is an Email – an electronic message transmitted over a network from one user to another.
- Can be as simple as a few lines of text, or include attachments such as pictures or documents.
- Email made up 75% of network traffic soon after the introduction of the internet.

# What Makes Up An Email

- The Header
  - Who sent the email.
  - To whom the mail is sent.
  - When the email was sent.
  - The email subject.
  - The size of the email.

# What Makes Up An Email

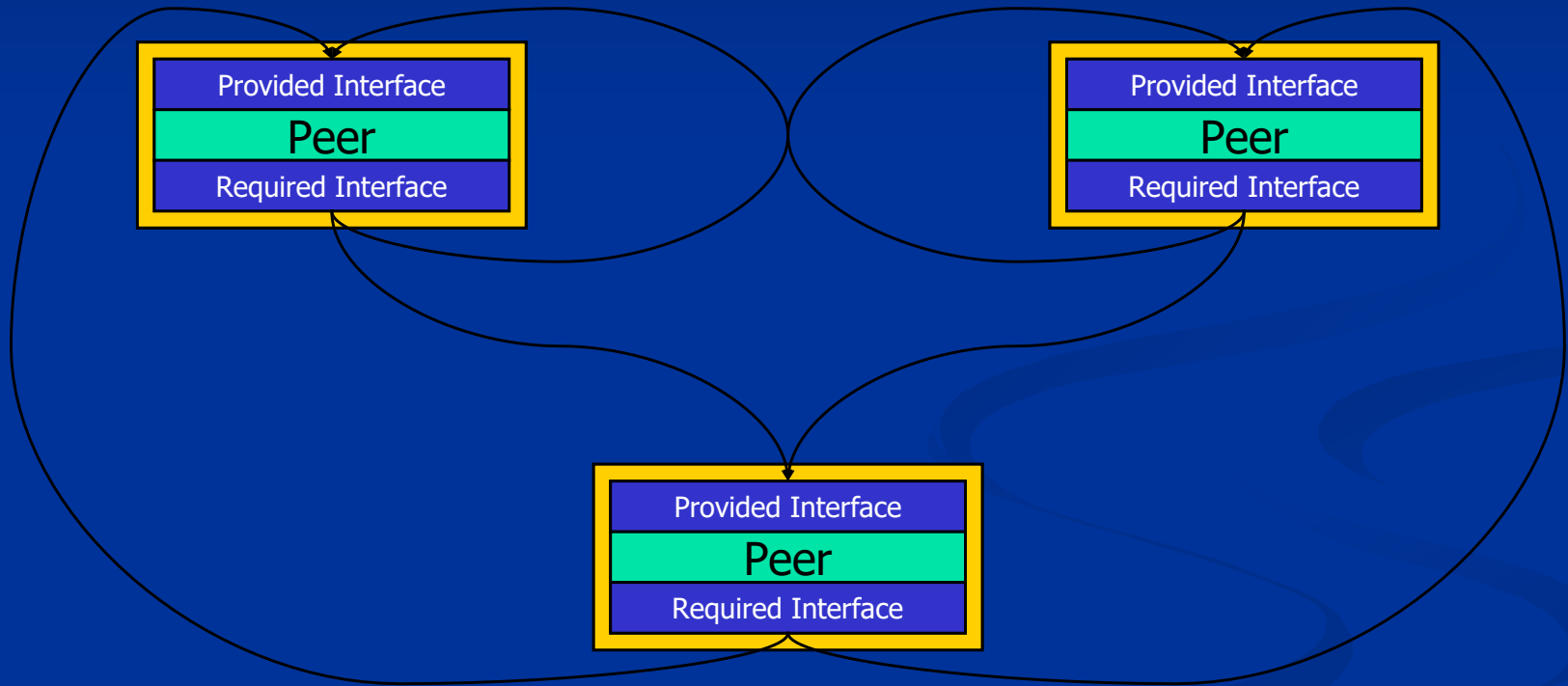
- The Body
  - Contains the message.
  - May also contain an attachment.
- Attachments
  - If not embedded within the body, attachments are sent along with the email.

# How Email Works

- Different Architectural Models exist for constructing computer systems.
- Some models include:
  - Peer-Peer
  - Pipe and Filter
  - Implicit Invocation
  - Client-Server

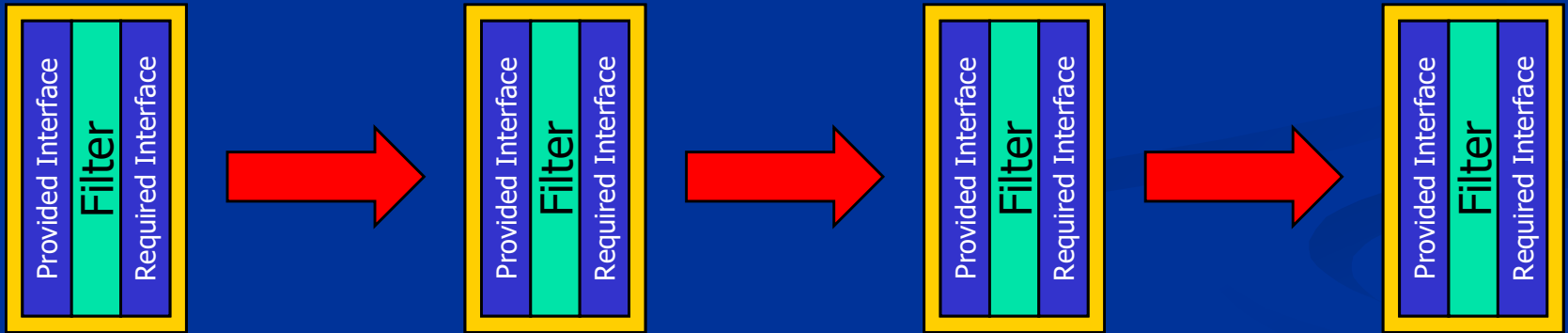
# How Email Works

## Peer-Peer Model



# How Email Works

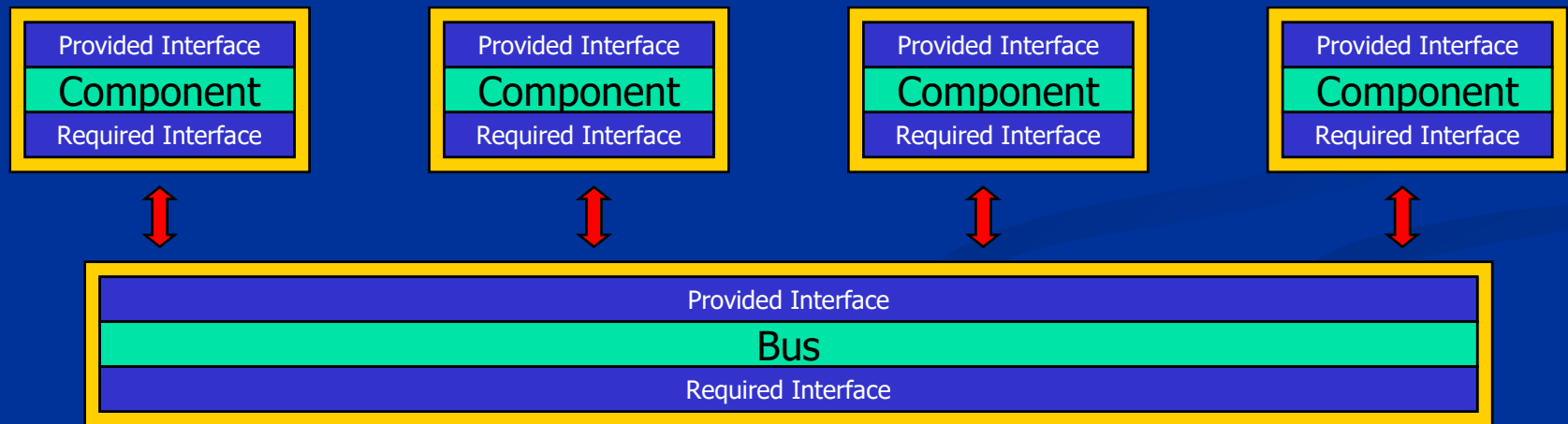
## Pipe and Filter Model





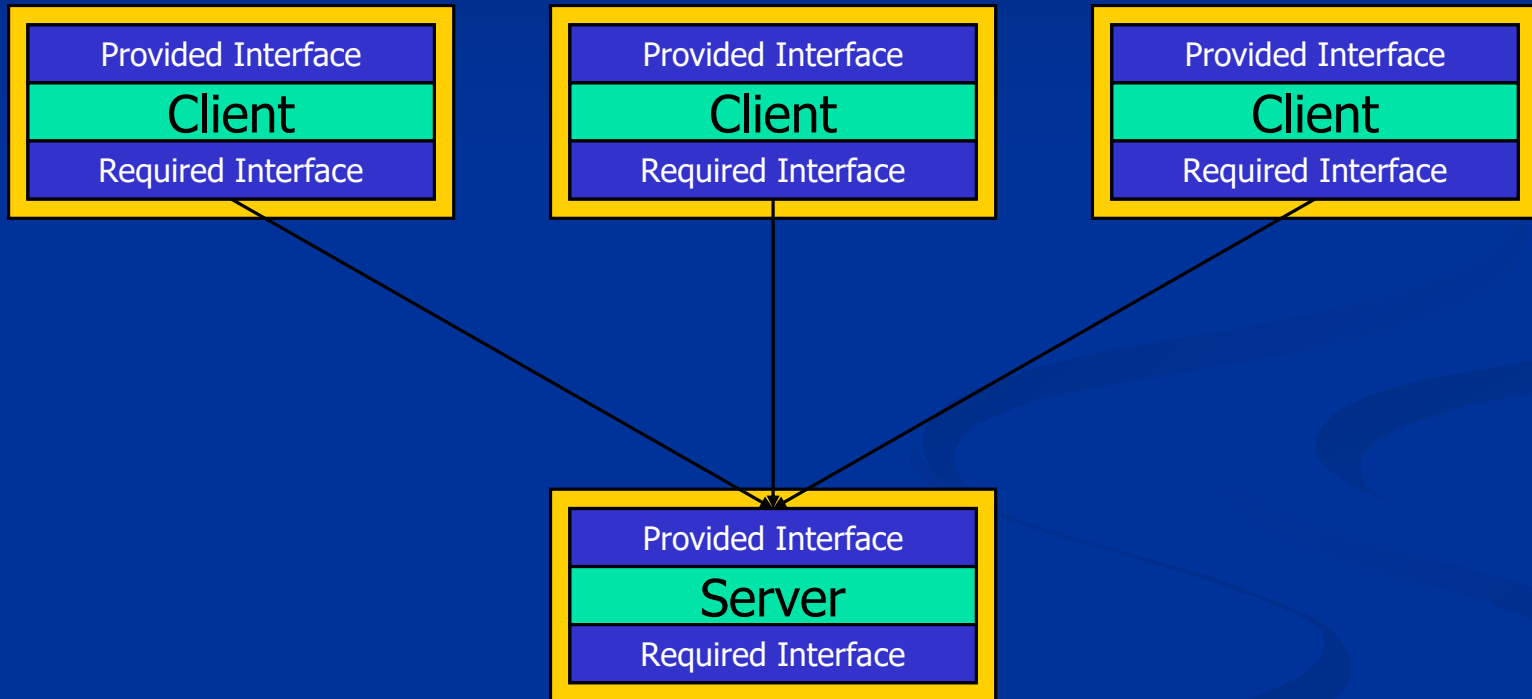
# How Email Works

## Implicit Invocation “Bus” Model



# How Email Works

## Client-Server Model



# How Email Works

- The model that works best for email is the Client-Server model.
- Clients carry out user interactions with the email server.

# How Email Works

## Clients

- Forms in which clients appear:
  - Application based - these are installed onto user's machines and include Microsoft Outlook and the freely available Outlook Express and Eudora.
  - Web based - these appear in a web browser's window and include Hotmail, Yahoo and Outlook web client.

# How Email Works

## Clients

- Clients vary greatly in functionality, but all provide a basic level of functionality that assists the user.
- Basic functions include:
  - Ability to create new emails.
  - Display and store received emails.
  - Hold address lists of contacts, a calendar, journal and other extra functions that help organize the user's working day.
  - The client is also configured with the account information and names or IP addresses of the email servers with which it will be communicating.

# How Email Works

## Servers

- An email server is typically a combination of processes running on a server with a large storage capacity – a list of users and rules, and the capability to receive, send and store emails and attachments.
- These servers are designed to operate without constant user intervention.
- Should process emails for months as sending, receiving and maintenance tasks are carried out at scheduled times. The client only has to connect to the email server when it sends and checks/receives new email.
- Sometimes it may be permanently connected to the server to allow access to shared address books or calendar information – this is typical of a LAN-based email server.

# How Email Works

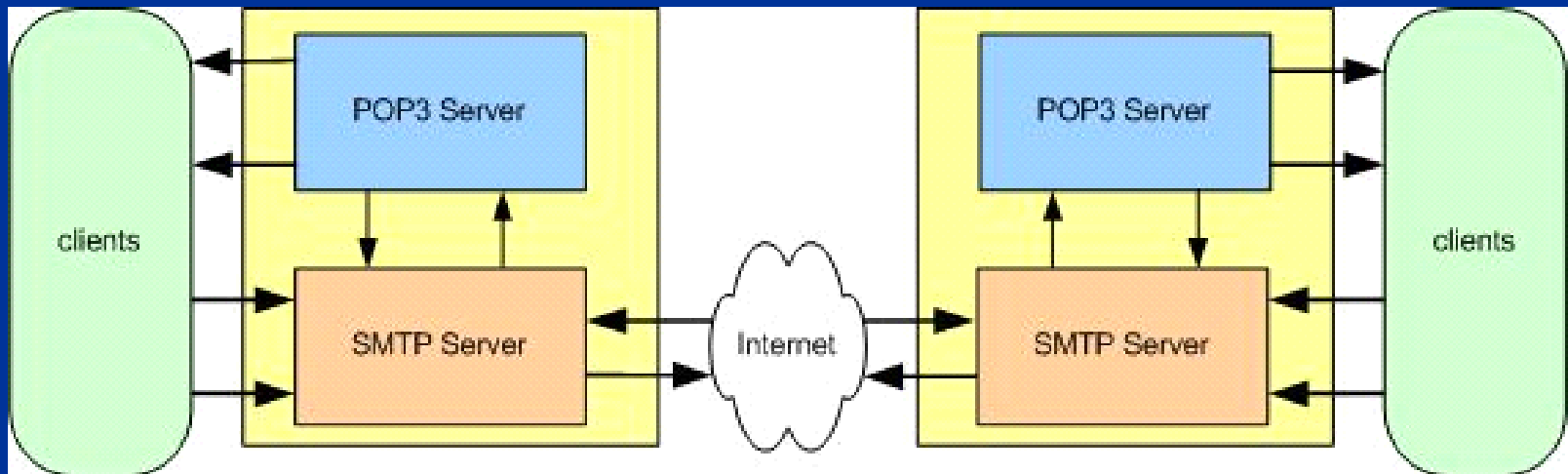
## Servers

- Most email servers conduct email services by running two separate processes on the same machine.
- One process is the POP3 (Post Office protocol 3) server, which holds emails in a queue and delivers emails to the client when they are requested.
- The other is the SMTP (simple mail transfer protocol) server that receives outgoing emails from clients and sends and receives email from other SMTP servers.
- These two processes are linked by an internal mail delivery mechanism that moves mail between the POP3 and SMTP servers.

# How Email Works

## Servers

- When the client calls the email server to send or check for mail it connects to the server on certain TCP/IP ports:
  - SMTP on port 25
  - POP3 on port 110.





# How Email Works

## Servers

- Email systems come in various formats, but the most common rely on a single server that provides both POP3 and SMTP services.
- Sometimes, in large organizations, these services are separated onto different servers.
- Currently, the majority of email servers use Windows NT or 2000.

# What Are TCP/IP Ports

- Most email servers run on a web server platform with email services installed.
- Each server has one or more unique TCP/IP (transmission control protocol/internet protocol) addresses. Attached to all TCP/IP addresses are many ports that range from 0 to 65,535.
- TCP/IP uses ports to allocate different jobs to different services. The server will listen for a client or application to call it on a port and direct traffic from that port to the required service.